User Manual
For
Amron International, Inc.

Model 2840R-XX Series
AMCOM IV Four Diver Rack Mount Communicators

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1 INTRODUCTION AND SPECIFICATIONS

1.1 INTRODUCTION

The 2840R-XX Series AMCOM IV Rack Mount Diver Communicators are a full featured four-diver hardwire communicator that uses state-of-the-art electronics to provide clear and reliable communications. The 2840R-XX is designed for integration into a standard 19 inch equipment rack and all necessary connections can be made via the front panel jack or rear mounted MS connector.

For maximum safety and to enjoy all the features of the 2840R-XX, it is important that the tender read and understand the entire manual, including all warnings, before first use.

1.2 ELECTRICAL SPECIFICATIONS

Input Impedance (Each Input) ..... 250 Ohms
Frequency Response ..... 300 - 10000 Hz
Common Mode Rejection ..... 40 dB Minimum
Current Drain Maximum Full Volume ..... 3 Amps
Minimum Quiescent ..... 0.190 Amps
Output Impedance ..... 4 Ohm
Power Supply Voltage ..... 12 V_{DC} Nominal (9 V_{DC} Min - 16 V_{DC} Max)
AC Power Operating Range ..... 90-264 V_{AC}, 50-60 Hz
Sensitivity (Input) ..... 0.5 mV
Output Power (RMS @ 4 Ohm Load, 12 VDC) ..... 10 Watts Audio
Battery Life (typical) ..... 25.8 Hours

1.3 MECHANICAL SPECIFICATIONS

Panel ..... Black Anodized Aluminum
Enclosure ..... Black Anodized Aluminum

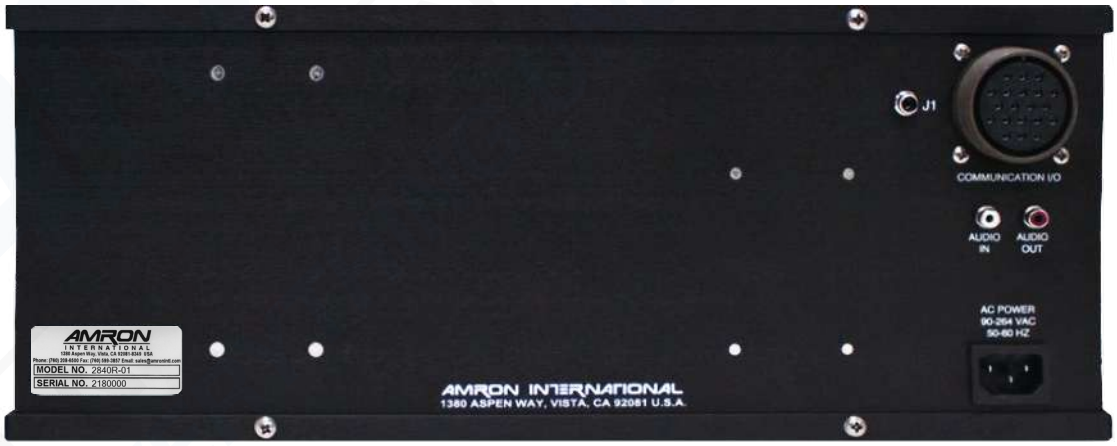
DIMENSIONS

Length ..... 12.5 in. (31.8 cm)
Width ..... 19.0 in. (48.2 cm)
Height ..... 7.0 in. (17.7 cm)
Weight with Battery ..... 19.5 Lbs. (8.85 kg)

1.4 AMCOM IV 2840R-XX SERIES FOUR DIVER RACK MOUNT COMMUNICATOR

The front panel contains all the controls and connections required to operate the communicator. It is intended that the divers will be connected to the communicator using the rear chassis MS connector, but the front panel 5-way binding post can be used as required.

The rear chassis contains the AC power inlet, recorder output and an MS connector with all the tender and diver connections. This allows a clean installation by routing all the connections from the back in the rack. The rear tender connections allow for the installation of a separate, remote tender station located away from the rack.



2 OPTIONS

The following options are available to customize the AMCOM communicator. Options have to be ordered at the time of purchase or the communicator has to be returned to AMRON for the option to be installed.

2.1 MODEL 2840R-02 WITH DSP3 HELIUM SPEECH UNSCRAMBLER

The AMRON's DSP3 Helium Speech Unscrambler uses state of the art Digital Signal Processor (DSP) technology to correct raw helium speech in clear, intelligible voice. The HSU option includes a complex noise reduction filter to improve communications in situations with high background noise levels.

3 ACCESSORIES

The following accessories are available for the AMCOM communicator. Accessories can be ordered at any time.

3.1 MODEL 2460-28 AMRON STANDARD HEADSET (DUAL EAR MUFF)

The Model 2460-28 is a light and comfortable headset designed for extended wear at an economical price. It comes equipped with color-coded, dual banana plugs that mate directly to AMCOM diver communicators as well as a spiral cord that can be extended up to 8 feet (2.4 meters).

3.2 MODEL 2401-28 AMRON HEAVY-DUTY HEADSET (DUAL EAR MUFF)

The Model 2401-28 is a heavy-duty headset with boom microphone. It comes equipped with color-coded, dual banana plugs that mate directly to AMCOM diver communicators. It includes a 6-foot (1.8-meter) cord.

3.3 MODEL 2401SM-28 AMRON HEAVY DUTY HEADSET (SINGLE EAR MUFF)

The Model 2401SM-28 is a high-quality heavy-duty Telex headset with a single ear muff and boom microphone. It has superior sound quality and comes equipped with color-coded dual banana plugs, 6-foot (1.8-meter) cord, and mates directly to communicator.

3.4 MODEL 2405-28 AMRON PUSH-TO-TALK MICROPHONE

The Model 2405-28 is a hand-held, noise-canceling, push-to-talk microphone that provides excellent sound quality to the diver. It comes equipped with a spiral cord that can be extended up to 6 feet (1.8 meters).

3.5 MODEL 2822-28 AMRON REMOTE WALK-AND-TALK MODULE

Designed for Full Duplex (4-Wire) applications, the Model 2822-28 provides the tender with mobility around the dive site while maintaining communications with the diver. It comes equipped with a small clip-on belt module that contains the connectors for the headset, and 25 feet (7.6 meters) of lightweight flexible cable. Custom cable lengths are available.

3.6 MODEL 2821-28 AMRON REMOTE PUSH-TO-TALK MODULE

Designed for 2-Wire applications, the Model 2821-28 provides the tender with mobility around the dive site while maintaining communications with the diver. It comes equipped with a small clip-on belt module that contains a push-to-talk switch, connector for the headset, and 25 feet (7.6 meters) of lightweight flexible cable. Custom cable lengths are available.

3.7 MODEL 3110 AMRON CHAMBER SPEAKER

The Model 3110 Chamber Speaker includes a push-to-talk switch along with a headset connector. When the occupant(s) want to talk to the operator, the push-to-talk switch on the chamber speaker must be pressed, even if the headset is in use.

3.8 MODEL 3113 AMRON CHAMBER SPEAKER

The Model 3113 Chamber Speaker has all the features of the Model 3115 except for the speaker on/off switch.

3.9 MODEL 3115 AMRON CHAMBER SPEAKER

The Model 3115 Chamber Speaker allows the operator to monitor conversations within the chamber with the speaker wired in 2-WIRE mode. There is a speaker on/off switch that allows the occupants to turn off the speaker for private conversations. The operator can talk to the occupant(s) by using the PUSH-TO-TALK BUTTON or PUSH-TO-TALK JACK. The Model 3115 also features a headset jack wired in Full-Duplex (4-Wire) mode that allows an occupant to use our standard 2460-31R or deluxe 2401-31R headset to talk to the chamber operator without the use of the PUSH-TO-TALK BUTTON or PUSH-TO-TALK JACK. This speaker is approved for US Navy chambers.

3.10 MODEL 3125 AMRON INNER-LOCK COMBO BOX

The Model 3125 features a talk-back speaker with on/off switch and headset jack that operates in the same manner as the Model 3115. It also includes a sound-powered phone with bracket, chamber temperature probe, scrubber power circuit wiring, chamber environmental conditioning unit wiring and electrical penetrator adaptor all together in a single pre-wired, pre-tested housing.

3.11 MODEL 3126 AMRON OUTER-LOCK COMBO BOX

The Model 3126 features a talk-back speaker with on/off switch and headset jack that operates in the same manner as the Model 3115. It also includes the sound-powered phone and bracket like the Model 3125 but does not have the additional chamber function wiring of the 3125.

4 CONTROLS AND CONNECTIONS

Before using the 2840R-XX diver communicator, the tender should be familiar with all the operating controls and connections. While reading this manual, you will find capitalized words such as PANEL SPEAKER. These words are to remind the reader that additional information can be found in this section of the manual.

4.1 TENDER CONTROLS

The following controls are located on the front panel of the 2840R-XX in the tender section.

4.1.1 **POWER SWITCH** – This switch controls power to the unit.

4.1.2 **SPEAKER SWITCH** – This switch allows the tender to turn off the speaker. If the tender is using a headset, it may be necessary to turn off the speaker in order to prevent acoustic feedback.

4.1.3 **PUSH-TO-TALK ALL DIVERS SWITCH** – This switch allows the tender to talk to all of the divers when operating in the 2-Wire mode. It is not necessary to use this control in the Full Duplex (4-Wire) mode. When using Full Duplex mode, this control allows the tender to interrupt the diver by forcing the diver into listen only mode.

4.1.4 **TENDER-TO-DIVERS VOLUME** – This control sets the volume for the divers' earphone. Rotate this knob clockwise to increase the volume.

4.1.5 **DIVER TO TENDER VOLUME** – This control sets the volume for the tender's earphone and/or panel speaker. Rotate this knob clockwise to increase the volume.

4.1.6 **PANEL SPEAKER** – A waterproof, acoustic horn speaker that allows the tender to listen to the divers. The volume level is controlled by the EARPHONE VOLUME control and it can be turned off using the SPEAKER SWITCH.

4.1.7 **BATTERY CONDITION INDICATOR** – A steady GREEN light indicates battery charge level is good. Blinking GREEN light indicates battery charge level is at a low level with less than 3 hours of running time available. Steady RED light indicates battery charge level is below the level necessary to guarantee proper operation.

WARNING: When BATTERY CONDITION INDICATOR is steady RED light, the battery should be recharged immediately.

4.1.8 **PANEL MICROPHONE** – A water-resistant condenser microphone that allows the tender to talk to the divers using the PUSH-TO-TALK BUTTONS. On the 2840R-XX, the volume level is controlled by the MICROPHONE VOLUME control. The PANEL MICROPHONE is muted when the SPEAKER SWITCH is turned off.

WARNING: Do not plug or cover the PANEL MICROPHONE hole. This may dampen the tender-to-diver communications or damage the microphone requiring replacement.

4.2 TENDER CONNECTIONS

4.2.1 **TENDER HEADSET JACK** – This is the dual banana jack (color-coded black) that functions as both an output (earphone) and input (microphone) for the tender as controlled by the PUSH-TO-TALK BUTTON and PUSH-TO-TALK JACK. Using this connection, the tender can be wired in either 2-Wire or Full Duplex (4-Wire) mode regardless of the mode used for the diver.

To connect the tender in the Full Duplex (4-Wire) mode, connect the earphone (black) banana plug of the headset to this jack and the microphone (red) to the TENDER MICROPHONE jack (red) as shown in the wiring diagram in section 4.8. In this mode, the tender does not have to use the PUSH-TO-TALK BUTTON to communicate with a diver who is also connected in the Full Duplex (4-Wire) mode. This configuration can be used even if the diver is connected in 2-Wire mode. In that situation, the tender is required to use the PUSH-TO-TALK BUTTON or PUSH-TO-TALK JACK.

The headset microphone is always active, which means that there can be acoustic feedback between the PANEL SPEAKER and the microphone if the tender is near the communicator. To prevent this, the PANEL SPEAKER can be turned off using the SPEAKER SWITCH. Another option is to move the tender away from the communicator by using the Amron Model 2822-28 Walk-and-Talk Module accessory. This allows the tender to communicate while other members of the surface crew listen using the PANEL SPEAKER. This module comes with 25 feet (7.6 meters) of cable (custom cable lengths are available).

The tender can also be connected in 2-Wire mode by stacking both the earphone (black) and microphone (red) banana plugs into this jack as shown in the wiring diagram in section 4.7. The diver does not have to be connected in 2-Wire mode if the tender is in 2-Wire mode. In order to talk to the diver, the tender must use either the PUSH-TO-TALK BUTTON or PUSH-TO-TALK JACK. Since the headset microphone is not active until one of the push-to-talk methods is used, there is no chance for acoustic feedback to occur and surface conversation or noise is not transmitted to diver and the PANEL SPEAKER can be left on. This may, for some situations, make for a better overall diving experience. If the tender requires more mobility at the dive site, the Amron Model 2821-28 Remote Push-to-Talk Module can be used to extend the headset cable. It includes a push-to-talk button on a clip-on belt module and comes standard with 25 feet (7.6 meters) of cable (custom cable lengths are available).

The tender may also use the optional Amron Model 2405-28 Push-to-Talk Microphone. This microphone comes with two color-coded banana plugs. The black plug goes into the TENDER HEADSET jack and the yellow plug goes in the PUSH-TO-TALK JACK as shown in the wiring diagram in section 4.9. To communicate with the diver, the tender presses the button on the side of the microphone. There is no chance of acoustic feedback since the PANEL SPEAKER is cut off when the tender uses the microphone. When using the Push-to-Talk Microphone, the SPEAKER SWITCH must be turned on in order to hear the diver.

4.2.2 **TENDER MICROPHONE JACK** – This is a dual banana jack (color-coded red) that functions as the microphone input from the tender's headset. It is only used if the tender is in Full Duplex (4-Wire) mode. On the 2840R-XX, the TENDER MICROPHONE VOLUME control adjusts the sensitivity of the input.

4.2.3 **PUSH-TO-TALK JACK** – This is a dual banana jack (color-coded yellow) that allows for remote keying of the push-to-talk function of the 2840R-XX. The difference between using the PUSH-TO-TALK JACK and PUSH-TO-TALK BUTTON is that the button allows the tender to communicate using the PANEL MICROPHONE.

4.3 DIVER CONTROLS

The following controls are located on the front panel in the individual diver sections.

4.3.1 **DIVER MICROPHONE VOLUME** – The 2840R-XX has a separate microphone volume control for each diver. This sets the gain for the diver's microphone amplifier and controls the diver's volume level to the tender and other diver.

4.3.2 **DIVER EARPHONE VOLUME** – The 2840R-XX has individual earphone volume controls for each diver. This allows the tender to set the best volume level for each diver.

4.3.3 **PUSH TO TALK DIVER** – There is a separate PUSH-TO-TALK momentary switch for each diver. Normally used in 2-Wire mode, this control allows the tender to talk to only one of the divers. The diver selected will hear both the tender and the other divers. It can be used in Full Duplex (4-Wire) mode to cut off the microphone of an individual diver.

4.3.4 **CROSSTALK** – There is a separate CROSSTALK momentary switch for each diver. Normally used in 2-Wire mode, this control allows the selected diver to talk to the other divers while the tender monitors the conversation.

4.4 DIVER CONNECTIONS

4.4.1 **DIVER MICROPHONE** – This is a dual 5-way binding post jack (color-coded red) that functions as both an output (earphone) and input (microphone) for the diver as controlled by the PUSH-TO-TALK BUTTON and PUSH-TO-TALK JACK. Using this connection, the diver can be wired in either 2-Wire or Full Duplex (4-Wire) mode regardless of the mode used for the diver.

To connect the diver in Full Duplex (4-Wire) mode, connect the diver microphone to this jack and the diver earphone the DIVER EARPHONE jack as shown in the wiring diagram in section 4.8. The diver can use this mode even if the tender is wired in 2-Wire mode.

To connect the diver in 2-Wire mode, connect both the diver microphone and earphone to this jack. If the diver umbilical uses banana plugs, simply stack both plugs into this jack as shown in the wiring diagram in section 4.7. In this mode, the diver microphone will be active and heard on tender headset and/or PANEL SPEAKER unless the PUSH-TO-TALK BUTTON or PUSH-TO-TALK JACK is activated.

4.4.2 **DIVER EARPHONE** – This is a dual 5-way binding post jack (color-coded black) that functions as the output for the diver's earphone. It is only used when the diver is in Full Duplex (4-Wire) mode.

4.5 OTHER CONNECTIONS

4.5.1 **EXTERNAL POWER INLET** – The 2840R-XX uses a standard IEC C14 power inlet located on the rear of the chassis. The communicator has a universal input with a voltage range of 90-264 VRMS and a frequency range of 50-60 Hz. No user adjustment is required.

4.5.2 **AUDIO IN** - This is a single RCA jack (color-coded Red) located on the rear of the chassis receives a standard audio line-level signal from another device. The audio mixer outputs this signal to the tender and divers. AUDIO IN may be connected to AUDIO OUT of another AMCOM rack mount communicator for double redundancy requirements or can double the number of users. It may also be connected to playback devices, a cell phone, a wireless tender device, etc.

4.5.3 **AUDIO OUT** - This is a single RCA jack (color-coded White) located on the rear of the chassis and sends a standard audio line-level signal to another device. The audio mixer outputs this signal to the tender and divers. AUDIO OUT may be connected to AUDIO IN of another AMCOM rack mount communicator for double redundancy requirements or can double the number of users. It may also be connected to recorder devices, a cell phone, a wireless tender device, etc.

4.5.4 **RECORDER OUTPUT** – This is a single RCA Phono jack (color-coded black) located on the rear of the chassis. It provides a transformer isolated signal of both the diver and tender communications. It is designed to drive the standard line-level inputs of audio or video recorders with input impedances as low as 600 Ohms.

4.5.5 **MS CONNECTOR** – A Military Series (MS) connector is located on the rear of the chassis providing connections for both the Tender and Divers. This allows connection without running wires to the front panel. The mating connector part number is MS-3106A-28-12P. The pin functions are shown in the following table:

MS CONNECTOR PIN OUT IDENTIFICATIONS	
PIN NUMBER	**FUNCTION**
A & B	Diver 1 Microphone
E & G	Diver 1 Earphone
L & M	Diver 2 Microphone
F & H	Diver 2 Headphone
K & S	Diver 3 Microphone
U & V	Diver 3 Headphone
Y & Z	Diver 4 Microphone
W & X	Diver 4 Headphone
J & T	Tender Microphone
P & Q	Tender Earphone
D & N	Recorder Output
C	Push-To-Talk (Low)

MS CONNECTOR PIN OUT IDENTIFICATIONS	
PIN NUMBER	**FUNCTION**
R	Push-to-Talk (High)
N	Audio Out (Low)
D	Audio Out (High)

4.6 OPTION CONTROLS: DSP3 HELIUM SPEECH UNSCRAMBLER

The controls for the DSP3 Helium Speech Unscrambler (HSU) are located in the section immediately right of the DIVER 3 controls on the front panel.

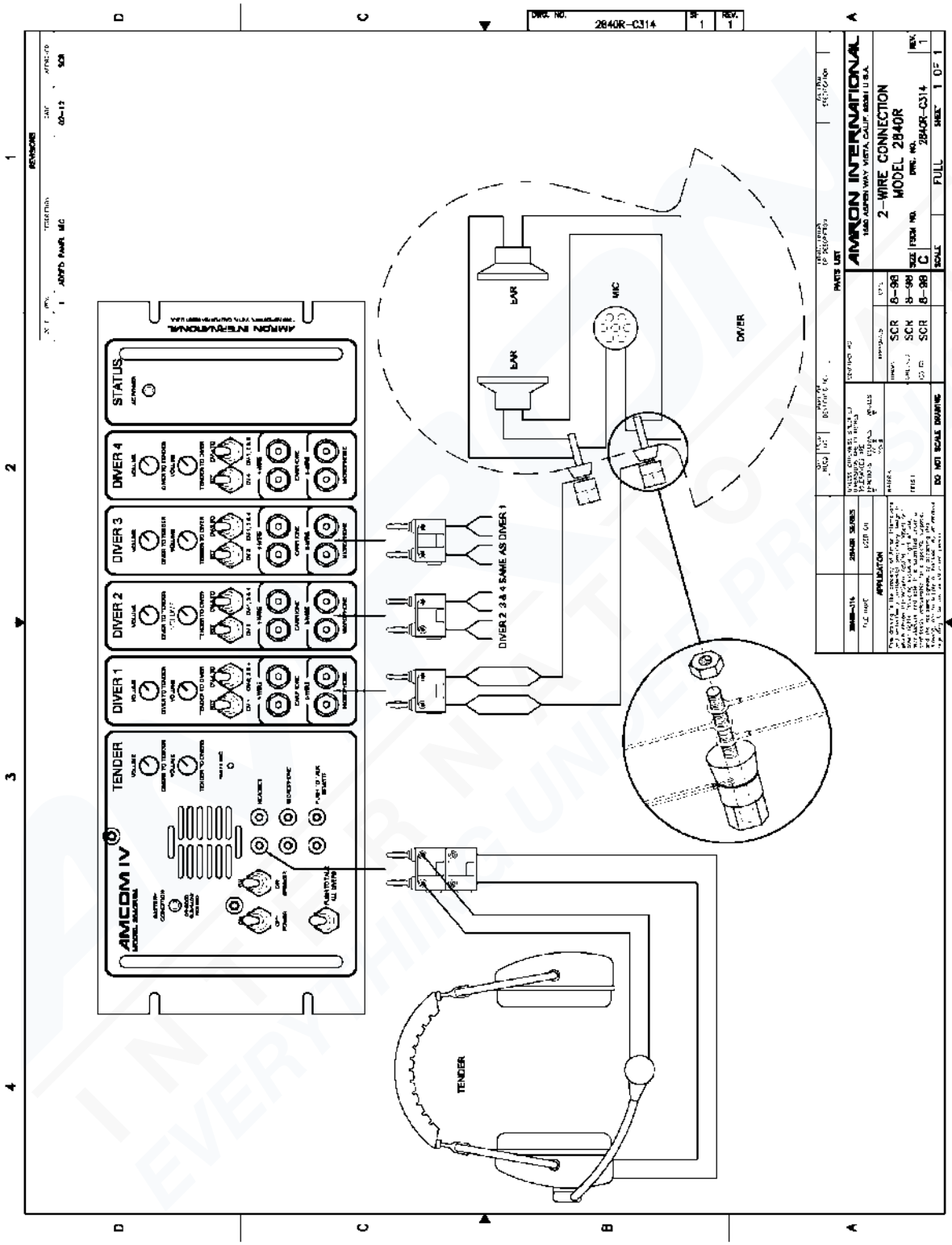
4.6.1 **ON/OFF SWITCH** – Allows the selection of air (OFF) or helium (ON) operation. In the OFF position, the divers' microphone signal bypasses the HSU. In the ON position, the microphone signals are routed to the HSU and the tender can adjust the controls as necessary.

4.6.2 **TREBLE BOOST** – Selects the amount of gain added to the High Frequency (HF) portion of the divers' microphone signals. This compensates for the HF drop-off in the sensitivity of most microphones. The TREBLE BOOST feature allows for optimum frequency enhancement and improved intelligible speech from the diver's voice.

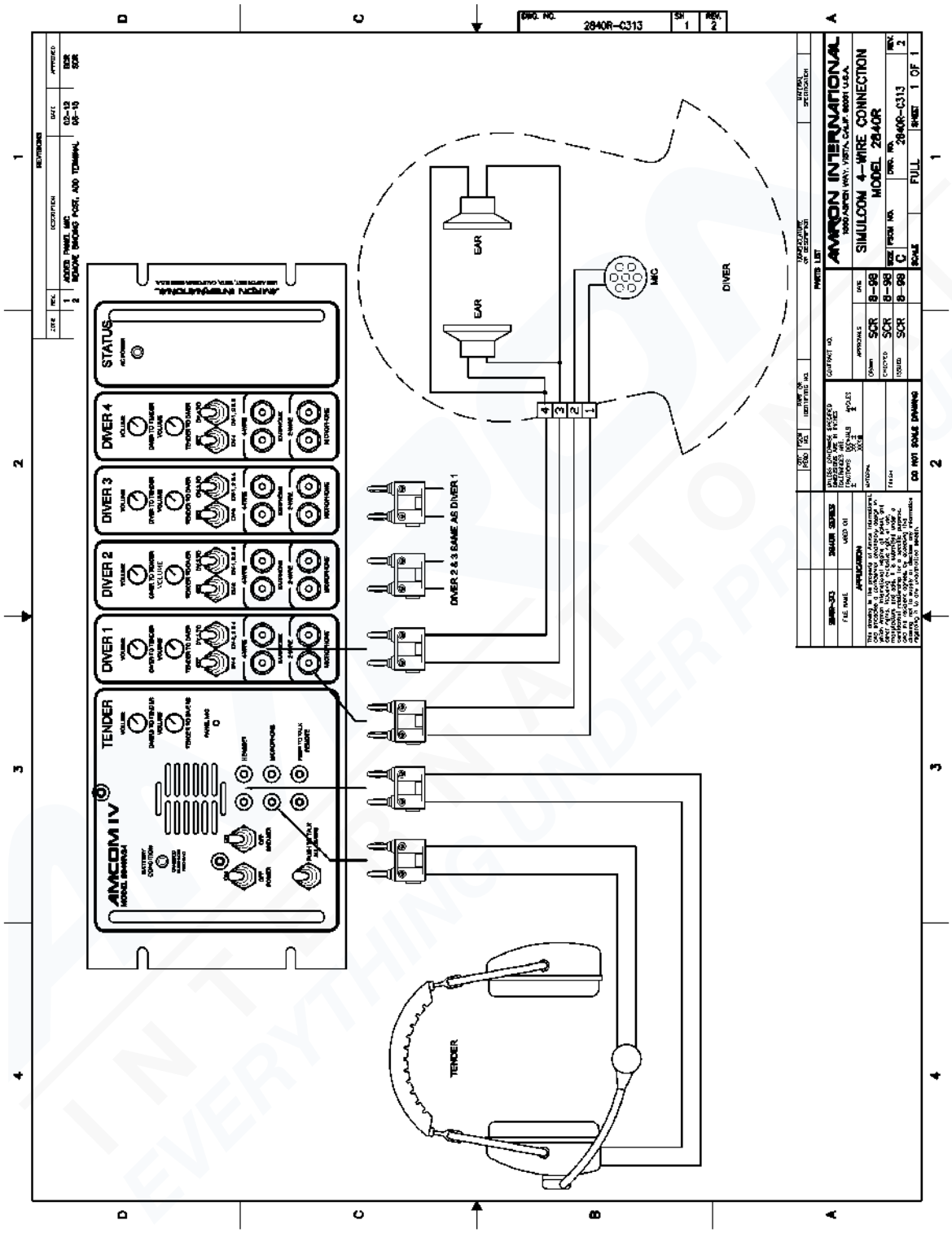
4.6.3 **DEPTH CONTROL** – Selects the amount of frequency correction performed by the HSU to produce intelligible speech. This control uses a multi-turn potentiometer and is equipped with a turn counting knob and lock. Once the desired setting is reached, the lock can be used to prevent accidental changes to this control.

4.6.4 **NOISE REDUCTION FILTER** – The Noise Reduction Filter (NRF) uses a complex Digital Signal Processor algorithm based on a statistical-model of human voice activity to capture the background noise and reduce it without affecting the divers' speech. The noise level can be reduced by up to 17 dB.

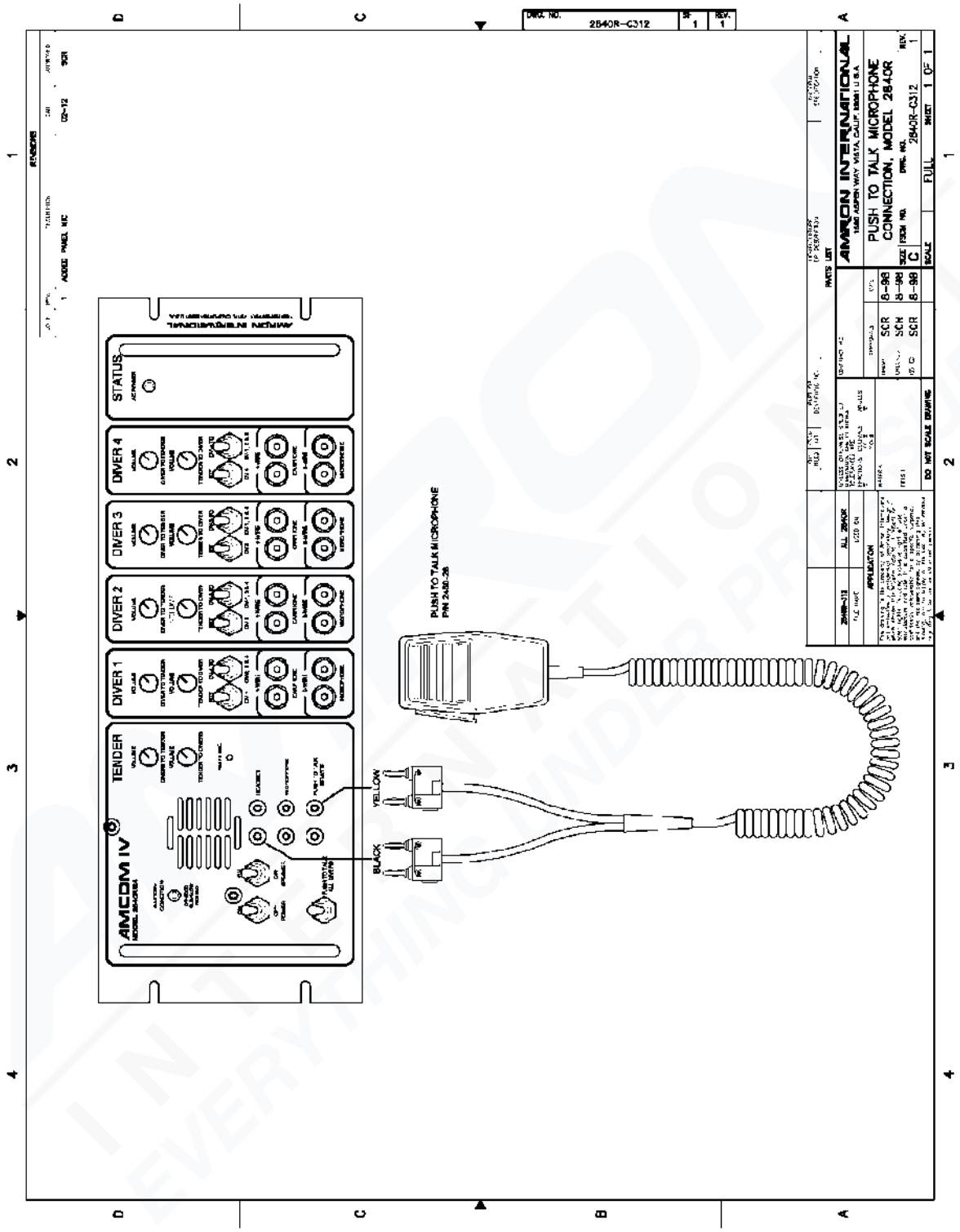
4.7 DRAWING, 2-WIRE CONNECTIONS



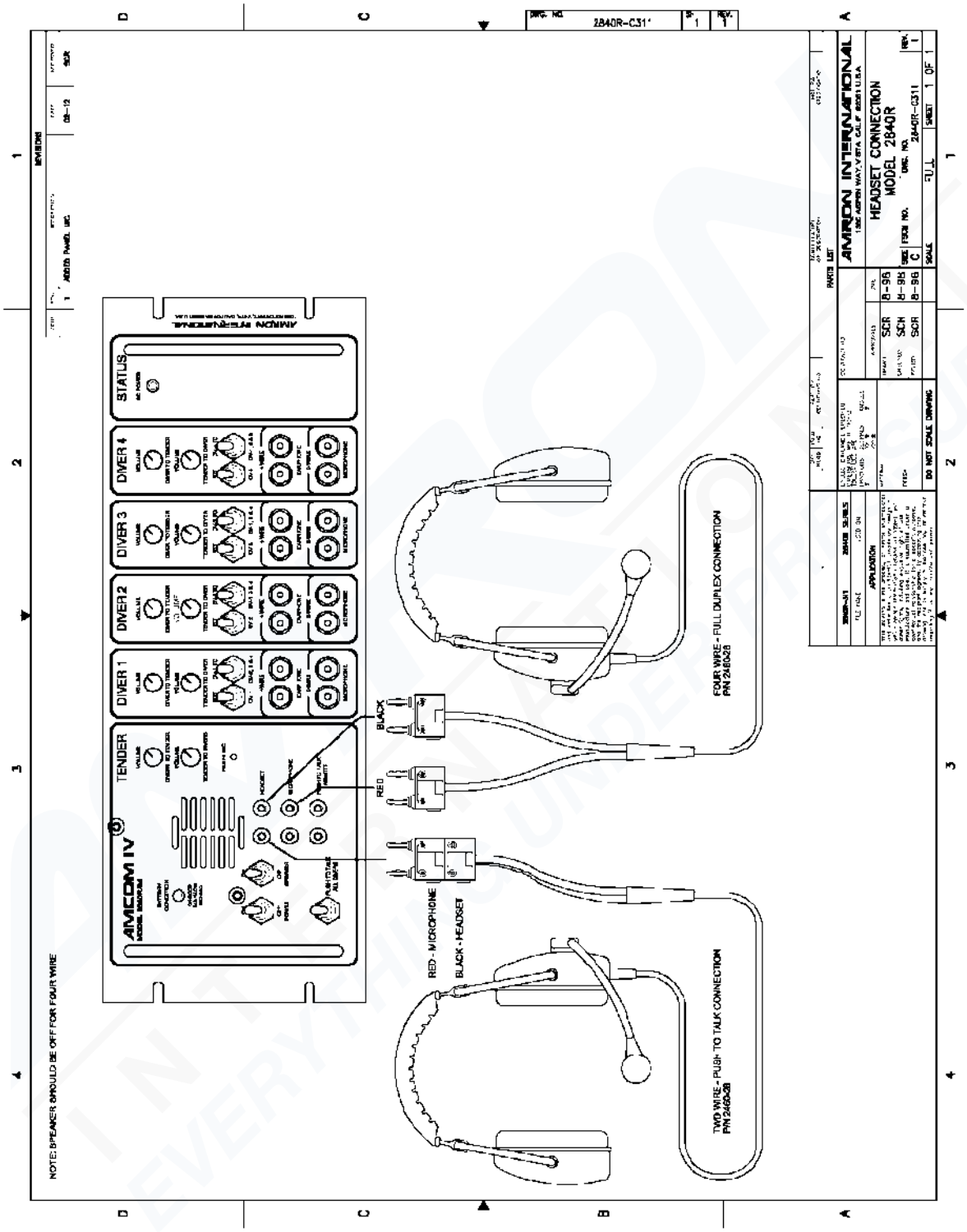
4.8 DRAWING, FULL DUPLEX (4-WIRE) CONNECTIONS



4.9 DRAWING, PUSH-TO-TALK MICROPHONE CONNECTIONS



4.10 DRAWING, OPERATOR CONNECTIONS, HEADSET



5 INSTALLATION AND OPERATION

5.1 OPERATION

The 2840R-XX Series AMCOM IV rack mount diver communicator is designed to mount in a standard electronic equipment rack, 19 inches wide. The unit has connections located on both the front and rear of the enclosure, to facilitate system wiring. For system installation all connections can be made to the rear of the unit, eliminating wires hanging from the front panel.

The AMCOM IV panels are graphically divided into sections; Tender Controls, Diver Controls, and Options. Items within these areas are functions or controls relating to the Tender, Diver(s) or Optional items.

5.2 AC POWER

When the unit is connected to AC power the LED power indicator on the STATUS section of the front panel will illuminate, confirming the presence of AC power.

The AMCOM IV is designed to operate from AC voltage (90-264 V_{RMS} 50-60 Hz) with a 12 VDC gel cell battery for backup operation in the event of loss of AC power. The switch over to battery operation is completely automatic, and occurs whenever AC power is interrupted. The internal rechargeable battery is maintained at full charge while the unit is operating from AC power. AC power indicator on the optional panel confirms the presence of AC power.

CAUTION: ALWAYS exercise extreme caution when operating AC powered equipment, especially when outdoors, where conditions are damp or wet, or when around other equipment. Never operate unit without earth-ground or without a working ground fault interrupter. When in doubt discontinue use immediately and have a qualified electrician inspect your equipment before using.

WARNING: All AC powered equipment should be used with a ground fault interrupter. All ground fault interrupters have a built in test circuit, check for proper operation before using.

5.3 BATTERY CHARGING

5.3.1 The 2840R-XX Series AMCOM IV rack mount diver communicator is supplied with a sealed lead acid back up battery. To charge the battery, insert the AC power cord to the AC inlet located on the back of the communicator. The internal battery charger is able to operate on AC input voltages from 90-264 VAC with a frequency 50-60 Hz. without the user having to make any adjustments.

5.3.2 The internal battery charger is designed to charge the battery in float mode so the charger can be left on indefinitely, without damage, to ensure the battery is fully charged and the unit is ready to use. A fully discharged battery will take approximately 10 hours to reach full charge (depending on the age of the battery and the surrounding temperature). To ensure maximum service life, the battery should be fully charged at least once every six months.

5.3.3 The operating time for a fully charged battery is approximately 25 hours. The exact operating time depends on the age of the battery and the ambient temperature. The sealed lead acid battery used in the communicator has a service life of 300 full charge/discharge cycles or 3 years. The BATTERY CONDITION INDICATOR will start to blink when the battery has approximately 3 hours operating time remaining. To maximize the service life, the battery should be recharged as soon as possible after the indicator starts to blink. When the battery reaches the full discharge state, the BATTERY CONDITION INDICATOR will turn off and the communicator will shut down.

5.4 MODES OF OPERATION

The 2840R-XX has the ability to operate in either 2-Wire or Full Duplex (4-Wire). Both the diver and tender can be connected in either mode and a combination of modes can be used. If either the diver or the tender is wired in 2-Wire mode, the tender must use a push-to-talk, either the PUSH-TO-TALK ALL SWITCH or PUSH-TO-TALK JACK, when talking to the diver.

2-WIRE communication is defined as a single communication path, normally the diver is the priority signal path – tender listens to diver. Signal reversing is accomplished by pushing the PUSH-TO-TALK BUTTON – diver hears tender. Often times a 4-conductor communication cable is used with two wires tied together as a pair for redundancy, this is still a 2-Wire system. Since only one person can talk at a time, there is a level of discipline that goes with using 2-Wire mode in order to obtain clear communication. One advantage of 2-Wire is that the tender's microphone is not active unless one of the two push-to-talk controls, PUSH-TO-TALK BUTTON or PUSH-TO-TALK JACK, are active. This eliminates any possible acoustic feedback between the tender's microphone and the PANEL SPEAKER. It also prevents noise from the surface reaching the diver and allows the tender to communicate with other members of the surface crew without involving the diver.

4-WIRE (Full Duplex) communication is defined as a dual communication path, a signal path (a pair of wires) for up-link and a signal path (a pair of wires) for down link. A common example of Full Duplex communication is the telephone. Full Duplex (4-Wire) has the advantage of natural communication without having to use the PUSH-TO-TALK BUTTON. This keeps the tender's hands free to perform other tasks. It does not require the same level of discipline to achieve clear communications that 2-Wire does. It has the advantage that neither the diver nor the tender is cut off when the other is talking. Because the diver's microphone is not connected in parallel with the earphone, the diver is louder and potentially clearer in Full Duplex (4-Wire) mode.

5.4.1 2-WIRE OPERATION

To connect the diver in 2-Wire mode, connect the communication umbilical wires to the DIVER MICROPHONE binding post jack on the communicator as shown in the wiring drawing in section 4.7. If the umbilical uses a banana plug, simply insert the plug into the binding post jack. Verify that it is firmly and completely seated. This may require that the external plastic nut be tightened down. If the umbilical uses bare wires, loosen the external plastic nut of the binding post jack. Either insert the bare end of the wire into the hole in the metal shaft of the binding post or firmly wrap the wire around the shaft. Tighten the nut until the bare wire is firmly fastened by the nut. The nut should not be fastened on the insulation of the wire nor should any of the bare wires touch.

The earphone connection is not used by the divers. The earphone jacks can be used to operate a remote speaker. Both diver and tender conversations will be heard.

When the tender uses a headset or push-to-talk microphone, follow the connection instruction in section 4.2.1 and in the wiring diagram in sections 4.9 and 4.10. When using the Amron Model 2821-28 Push-to-Talk Microphone, the tender presses the push-to-talk button on the side of the microphone and speaks clearly at a distance of between 1 and 2 inches (25 to 51 mm). When done speaking, the tender releases the push-to-talk button to allow the diver to communicate.

In 2-wire mode the tender must press the Push-to-talk Switch to be heard. If you are using the Amron Remote Push-to-Talk, Model 2821-28, the tender may press the Push-to-talk Switch on the belt module.

5.4.2 4-WIRE OPERATION

To connect the diver in Full Duplex (4-Wire) mode, connect the communication umbilical wires to the DIVER MICROPHONE and DIVER EARPHONE jacks as shown in wiring diagram in section 4.8. If the umbilical uses a banana plug, simply insert the plug into the correct binding post jack. Verify that it is firmly and completely seated. This may require that the external plastic nut be tightened. If the umbilical uses bare wire ends, loosen the external plastic nut of the binding post jack. Either insert the bare end of the wire into the hole in the metal shaft of the binding post or firmly wrap the wire around the shaft. Tighten the nut until the bare wire is firmly fastened by the nut. The nut should not be fastened on the insulation of the wire nor should any of the bare wires touch. The diver microphone will be louder in Full Duplex (4-Wire) mode than in 2-Wire mode. This can be a significant advantage when using longer dive umbilical cables.

To use Full Duplex (4-Wire) mode, the tender must use a headset and connect per the instructions in 4.9. The tender will have to use the PUSH-TO-TALK BUTTON to communicate if the diver is in 2-Wire mode. When the tender uses a headset, the SPEAKER SWITCH should be turned off to prevent acoustic feedback. Acoustic feedback can also be avoided by moving the tender away from the 2840R-XX by using the Amron Model 2822-28 Remote Walk-and-Talk Module. In this way, the PANEL SPEAKER can allow other members of the diving crew to monitor the dive operation or to communicate to the diver by pressing the PUSH-TO-TALK BUTTON and talking into the speaker.

NOTE:

- Diver microphone is louder in 4-wire than 2-wire operation.
- Tender earphone is louder than diver’s earphones for both 2-wire and 4-wire operation.
- Tender earphone is about four times louder than diver's earphone.

5.5 VOLUME CONTROLS (2-WIRE)

Turn power switch to ON, turn speaker switch to ON, and adjust both volume controls to mid-scale. Tender has to depress PUSH-TO-TALK BUTTON in order to talk to diver. Tender and Diver talk to each other during Tender adjusting volume controls as below:

NOTE: The upper row of volume controls, set the microphone volume, the lower row of volume controls, set the earphone volume. Tender controls are considered master controls. The optimum settings are when controls are closely matched, with differences compensating for differences in diver levels.

5.5.1 TENDER TO DIVER

While tender is talking into the panel speaker and depressing PTT switch, tender adjusts this volume control to a comfortable diver hearing level.

5.5.2 DIVER TO TENDER

While diver is talking, tender adjust this volume control to a comfortable hearing level.

5.6 OTHER DIVER CONTROLS (2-WIRE)

5.6.1 PTT ALL DIVERS SWITCH

Push-to-talk to All Divers switch is located on the left bottom corner below Power ON/OFF switch. This switch allows all divers to hear the Tender, it changes all divers to be listening and tender in talking mode.

5.6.2 CROSS TALK SWITCHES

The cross-talk switches allow conversations from diver to diver in the two-wire mode. Cross-talk between divers must be tender operated via the cross-talk switches. One example of operation between DV 1 & DV 2 is: Cross-talk DV 1 to DV 2 allows diver 1 to speak to (but not hear) diver 2. Cross-talk DV 2 to DV 1 allows diver 2 to speak to (but not hear) diver 1. The tender will hear conversations on speaker or headset.

5.6.3 DIVER PUSH TO TALK (PTT) SWITCHES

Depressing the divers individual Push to Talk switch, located beside the cross-talk switch, will engage the diver's microphone and earphone as long as it is depressed.

5.7 VOLUME CONTROLS (4-WIRE)

Turn power switch to ON; turn speaker switch to OFF; adjust both volume controls to mid-scale. Tender to use headset. Tender and Diver talk to each other during Tender adjusting volume controls as below:

NOTE: The upper row of volume controls, set the microphone volume, the lower row of volume controls, set the earphone volume. Tender controls are considered master controls. The optimum settings are when controls are closely matched, with differences compensating for differences in diver levels.

TENDER TO DIVER – Tender talks and divers determine a comfortable listening level, having the tender adjust as needed.

DIVER TO TENDER – While diver is talking, tender adjusts this volume control to a comfortable hearing level.

Connect diver 1's umbilical to the Diver 1 input. Repeat for other divers.

Connect tender headset earphones to Headset (input), and headset microphone to Tender Microphone (input). Turn speaker off to avoid acoustic feedback. Operation with speaker is possible by extending tender's headset away from the speaker. Use Amron Model 2822-28 headset extension cable (25 foot).

Operating the PTT (push-to-talk) switch will establish a priority channel for communication. PTT cuts out the diver's microphone and prevents divers from talking.

This allows an important conversation to be carried on without interruption, or the ability to establish a clear channel of communication.

NOTE: When operating with a standby diver who does not have his hat/helmet on, acoustic feedback may occur. This can be avoided by turning his volume down Diver to Tender, which cuts off his microphone, yet will enable him to monitor the diver/tender conversation.

5.8 OTHER TENDER CONTROLS

5.8.1 PUSH-TO-TALK SWITCH

Activation of this switch connects the tender to the diver, necessary for two wire conversations, optional for Full Duplex (4-wire) conversations. Always used when using the PANEL MICROPHONE for talking to the divers.

5.8.2 MICROPHONE JACKS (RED)

Connection for headset microphone: plug red banana plug into these jacks when operating in the Full Duplex mode.

5.8.3 HEADSET JACKS (BLACK)

Connection for headset earphones, external speaker: plug both headset banana plugs (red & black) into the black headset jacks, red & black when operating in the two-wire mode. Plug in only the black headset banana plug when operating in the Full Duplex mode. Plug handheld microphone black banana plug into the black headset jacks.

5.8.4 PUSH-TO-TALK JACKS (YELLOW)

Connection for remote control of the push-to-talk function: plug the handheld microphone yellow banana plug into this jack. Operation of the handheld microphone is simple and straight forward, hold the microphone in your hand, place the microphone within one half inch of your mouth, depress lever on side of microphone and speak clearly and distinctly into the microphone.

The communicator has an automatic speaker disconnect relay which disconnects the front panel speaker when using the handheld microphone. This greatly reduces the background noise during transmissions to the divers. This feature is also functional when using an AMRON headset, and headset extender (Model 2821-28).

5.8.5 SPEAKER ON/OFF SWITCH

For normal operation the speaker switch is left on. When operating in noisy conditions, it may be advantageous to use a headset to cut out the background noise. In this case it will be desirable to shut off the speaker. There are other conditions when turning off the speaker is desirable, situations where the nature of the work requires a confidential handling of communications.

5.8.6 RECORD JACK (REAR PANEL)

Isolated audio output to drive a recorder. Use standard RCA type audio cable to connect the diver radio to the audio recorder. Test record audio, checking both tender to diver conversation and diver to tender conversation for proper record levels.

5.9 OPTIONS

5.9.1 DSP3 HELIUM SPEECH UNSCRAMBLER OPTION

The DSP3 Helium Speech Unscrambler option is located on right side of the communicator and accommodates a wide range of operating depths. This state-of-the-art digital design can accommodate a multitude of functions ranging from the correction of the diver's raw helium speech to normal intelligible voice levels, advance treble boost and complex noise reduction filters (NRF)

Diver radios configured with this option are only supplied with the AC power option. This is due to the power requirements of the Unscrambler option. The radio can be operated in the air mode by turning the HSU off.

Amron's advanced NOISE REDUCTION FILTER (NRF) incorporates a complex DSP algorithm which filters out background noise while allowing the diver's speech to be clear and intelligible. Amron's NRF automatically captures the frequency spectrum of applied background noise within the audio frequency bandwidth and reduces it without affecting the diver's speech.

The Treble Boost Control provides a means of adjustment to enhance the diver's microphone performance. The treble boost feature allows for optimum frequency enhancement and improved intelligible speech from the diver's voice.

The Depth Control is used to change the amount of shift in the frequency of the diver's voice. The depth control is advanced as the diver's depth increases. There is a certain amount of interaction between the controls, and also a difference between diver voices, therefore it is necessary to tune the unit to the diver. Intelligibility is the desired result; each operator will find a combination which works best. The frequency shifting algorithm changes the amount of correction to the raw helium speech. The Depth Control is a multi-turn control with a locking feature. This allows the tender to finely adjust the level necessary and lock the control to prevent accidental adjustments.

At power-up, all the controls should be in the minimum (far left) position. Have the diver speak and adjust the DEPTH CONTROL as necessary to achieve the best speech quality. Then adjust the TREBLE BOOST as necessary to improve the quality. There is some interaction between these controls so you may have to go back and adjust the DEPTH CONTROL. Once the best speech quality settings are found, the NOISE REDUCTION FILTER can be adjusted, if necessary, to reduce any background noise.

Operating in 2-Wire and Full Duplex (4-Wire) modes are possible with the HSU. In 2-Wire mode, the tender's push-to-talk switch interrupts signals from the diver. In Full Duplex mode, the tender will hear the diver at all times and tender must use a headset to talk to the divers without using the push-to-talk switch. Use of a headset to monitor helium speech is strongly recommended to enhance intelligibility.

6 MAINTENANCE

The following section describes the procedures for checking the operation of your 2840R-XX diver communicator, general maintenance procedures, and how to troubleshoot common problems.

6.1 GENERAL MAINTENANCE

The 2840R-XX Series diver communicator is designed to provide years of continuous, failure-free service when properly used and maintained. There are a few important things that the user can do to extend the life of their equipment. Handle the diver communicator with care when not installed in the rack.

1 If operating as a standalone unit (not in a rack), select a proper location where the communicator will be safe from hits or falls. The wires connection to it should be routed to avoid possible tripping of personnel.

2 Clean the communicator after use or when needed. If the equipment is on an extended work program, have the tender clean the equipment during slow work periods.

6.2 RECOMMENDED MAINTENANCE SCHEDULE

The following sections outline the recommended scheduled maintenance for the 2840R-XX.

6.2.1 DAILY MAINTENANCE

Wipe off any accumulated dirt and dust on the front panel or connectors using a clean, damp cloth. Pay particular attention to where the various front panel components attach to the panel.

6.2.2 WEEKLY MAINTENANCE

Wipe off any accumulated dirt and dust on the front panel or connectors using a clean, damp cloth. Pay particular attention to where the various front panel components attach to the panel. Inspect the switches, binding posts and volume controls for smooth operation.

6.2.3 6-MONTH CHECK

Wipe off any accumulated dirt and dust on the front panel or connectors using a clean, damp cloth. Pay particular attention to where the various front panel components attach to the panel.

1 Inspect the switches, binding posts and volume controls for smooth operation.

2 Connect to AC power to recharge the battery

3 Perform the 2-Wire and Full Duplex (4-Wire) system checks as described in section 7.1.

6.2.4 YEARLY CHECK

For maximum service life, it is recommended that the diver communicator be sent back to Amron for a yearly check.

6.2.5 LONG TERM STORAGE

If the diver communicator is to be stored for a period greater than 30 days, it is recommended that it be stored in a cool dry location. Make sure that the POWER SWITCH is turned off during storage. The 2840R-XX communicator should be stored connected to AC power. This ensures that the communicator will be fully charged and ready to use when needed.

7 TROUBLESHOOTING

Most problems are usually simple issues that can often be found by careful inspection of the diver communicator, diving umbilical, and diver helmet wiring. The following section will describe the troubleshooting procedure for several common issues. If these sections do not cover your particular issue, it is recommended that the diving umbilical be disconnected from the diver communicator and the check-out procedures in section 7.1 be conducted. If the diver communicator passes the check-out procedures then the issue is most likely in the umbilical connections, the umbilical itself, or the wiring of the diver's hat/helmet

7.1 DIVER RADIO COMMUNICATOR CHECK PROCEDURES

The following are a series of step-by-step procedures to perform a functional check of your 2840R-XX series communicator using only a headset. These steps check all communication functions in both 2-Wire and Full Duplex (4-Wire) mode. If the communicator checks out using these procedures, then any communication problems are probably located somewhere else in the system.

7.1.1 2-WIRE CHECK

This procedure checks the communicator functions in the 2-Wire mode.

1 Set all the volume controls to the mid-scale (halfway) position.

2 Turn the SPEAKER SWITCH off to avoid acoustic feedback.

3 Turn on the communicator and verify the BATTERY CONDITION INDICATOR is on or blinking. If the LED does not come on at all, then replace or recharge the battery. If that does not resolve the problem, then go to the troubleshooting section to determine the cause.

4 Identify the microphone and headset leads. When using an Amron headset, the microphone is the red banana plug and the headset is the black banana plug.

5 Plug the microphone lead into the TENDER HEADSET (black) jack and the headset lead into the DIVER MICROPHONE (red) jack.

6 Don the headset. Talk into the microphone while pressing the PUSH-TO-TALK BUTTON. You should be able to hear yourself in the headset. Adjust the TENDER TO DIVER VOLUME control and verify that the level can be adjusted to a comfortable level.

7 Unplug the microphone lead. Turn on the SPEAKER SWITCH. Press the PUSH-TO-TALK BUTTON while speaking into the PANEL SPEAKER. You should be able to hear yourself in the headset. Adjust the TENDER TO DIVER VOLUME if necessary and verify that the level can be adjusted to a comfortable level.

8 Plug the microphone lead into the TENDER HEADSET (black) jack. Short the PUSH-TO-TALK JACK (yellow) with a short piece of wire. Talk into the microphone and verify that you hear yourself in the headset. Remove the short. Turn off the SPEAKER SWITCH.

9 Move the microphone lead to the DIVER 1 MICROPHONE (red) jack and move the headset lead to the TENDER HEADSET jack.

10 Talk into the microphone and verify you can hear yourself in the headset. The PUSH-TO-TALK BUTTON should not be pressed. Adjust the DIVER TO TENDER VOLUME control and verify that the level can be adjusted to a comfortable level.

11 Repeat steps 9 and 10 for the remaining diver channels.

This completes the check of the 2-Wire function of the communicator. If at any point in the test you were not able to hear yourself in the headset as indicated by the test, refer to the troubleshooting section to determine the cause.

7.1.2 FULL DUPLEX (4-WIRE) CHECK

This procedure checks communicator functions in Full Duplex (4-Wire) mode.

1 Set all volume controls to the mid-scale (halfway) position.

2 Turn the SPEAKER SWITCH off to avoid acoustic feedback.

3 Turn on the communicator and verify the BATTERY CONDITION INDICATOR is on or blinking. If the LED does not come on at all, then replace or recharge the battery. If that does not resolve the problem, then go to the troubleshooting section to determine the cause.

4 Identify the microphone and headset leads. When using an Amron headset, the microphone is the red banana plug and the headset is the black banana plug.

5 Plug the microphone lead into the TENDER MICROPHONE (red) jack and the headset lead into the TENDER HEADSET (black) jack.

6 Don the headset and talk into the microphone. You should be able to hear yourself in the headset. Adjust the DIVER TO TENDER VOLUME control and verify the level can be adjusted to a comfortable level.

7 Move the headset microphone lead to the DIVER 1 MICROPHONE (red) jack. Talk into the microphone. You should be able to hear yourself in the headset. Adjust the DIVER TO TENDER VOLUME control and verify that the level can be adjusted to a comfortable level.

8 Move the headset lead to the DIVER 1 EARPHONE (black) jack. Talk into the microphone. You should be able to hear yourself in the headset.

9 Repeat steps 7 and 8 for the remaining diver channels.

This completes the check of the Full Duplex (4-Wire) function of the communicator. If at any point in the test you were not able to hear yourself in the headset as indicated by the test, refer to the troubleshooting section to determine the cause.

7.2 CONNECTION ISSUES

Most diver communicator problems are caused by bad connections. Making good connection ns will result in years of good communications. For longer life, all connections should be soldered and copper wire must be tinned. It is strongly suggested that dual banana plugs be used topside to provide convenient and secure connections.

All cable splices must be soldered. Splices should be staggered and covered with shrink tubing (preferably shrink tubing with an adhesive sealant) and a general splice cover to protect the connections. Potting the splices to create a reliable splice is preferred but not necessary to create a reliable splice. A great number of problems are very simple failures and can often be found by a very careful and close inspection of the unit or system. Logical deductions and equipment familiarity can often reduce the suspected area to just one component or circuit. Often upon examination, clues are revealed which can also aid in locating and correcting the problem. Visual inspections should include checking all screws for tightness, all solder joints for correctness, broken parts, corrosion, electrolysis, foreign material, check connectors for proper insertion and alignment. Check to see that unit is turned on, speaker on.

7.3 LOW BATTERY INDICATION

The BATTERY CONDITION INDICATOR indicates the battery level or state-of-charge by monitoring the battery voltage. It is recommended that the 2840R-XX be recharged for at least 10 hours if the BATTERY CONDITION INDICATOR is low or bad. If the BATTERY CONDITION INDICATOR indicates a low (blinking LED) or bad (off LED) after charging, then either the battery is bad and needs to be replaced or the charger has malfunctioned.

7.4 CHECK BATTERY CONDITION

NOTE: YOU MUST DISCONNECT THE AC POWER CORD FROM AC POWER BEFORE CHECKING THE BATTERY CONDITION.

1 Disconnect AC power cord from the AC inlet located on the back of communicator.

2 Turn communicator power switch “ON” and observe the battery condition indicator. The battery indicator will display the condition of the battery.

- “STEADY GREEN” light indicates the battery has sufficient voltage to operate the unit.
- “BLINKING GREEN” light indicates the battery is low and will need charging shortly, three hours of operating time remain.
- “STEADY RED” light indicates the battery voltage is too low to operate the unit. Communication should stop.

NOTE: A battery unused for a period of time will typically display a higher voltage when initially powered on but will dissipate rapidly. This condition known as “surface charge” is the result of a load placed on the battery causing the voltage to drop quickly. It is a good idea to leave the unit on for five minutes before relying upon the Battery Condition indicator.

3 Reconnect AC power cord into the AC inlet located on the back of communicator.

7.5 CHECK BATTERY VOLTAGE

1 Disconnect AC power cord from the AC inlet located on the back of communicator.

2 Access battery by following steps 1 through 5 of section 7.6 (next section).

3 Connect multimeter leads directly to the 12V battery and select DC Voltage.

4 Turn communicator Power Switch “ON” and read voltage on multimeter. If voltage reads 11.5V or less, charge the battery. If the battery’s voltage continues to drop quickly, replacing the battery may be necessary.

5 Reinstall communicator by following steps 11 through 15 of section 7.6 (next section).

7.6 BATTERY INSTALLATION

The 2840R-XX Series AMCOM II rack mount diver communicator is supplied with a single 12V gel-cell sealed lead-acid battery. To remove and install the battery:

1 Turn off communicator.

2 Disconnect AC power cord from the AC inlet located on the back of communicator.

3 Disconnect all cables.

4 Remove communicator from rackmount and place on a flat clean surface.

5 On the rear of communicator, remove the (2 each) Philips pan head screws and star washers from top lid and lift off.

6 Locate battery and disconnect the two slide terminals from the battery (Black terminal from negative and red terminal from positive).

7 Remove the (4) lock nuts from battery bracket (2 on top and 2 on bottom), and remove the 12VDC battery from the chassis noting the position of the battery.

8 Install new battery in the same position as the old battery.

9 Reinstall battery bracket with (4) lock nuts (2 on top and 2 on bottom) and hand tighten.

10 Reconnect the two slide terminals to the battery (Red terminal to positive first and then black terminal to negative).

11 Reinstall the top lid of rackmount with (2 each) Philips pan head screws and star washers and hand tighten.

12 Perform Power On - Battery Check (see section 7.4 for details).

13 Reinstall communicator to rack.

14 Reconnect the AC power cord into the AC inlet located on the back of communicator and allow battery to charge for 4 hours (charging time may vary depending on the age of the battery and the surrounding temperature).

15 Reconnect all cabling. The communicator is ready to use while charging.

7.7 UNIT NOT OPERATING

The most common reason that a diver communicator appears to be dead when the POWER SWITCH and SPEAKER SWITCH are turned on is a bad battery or loose AC connection.

If the battery and AC connections appear good and the communicator fails the check-out procedure, then remove the screws holding the lid. Verify that the connectors on the Printed Circuit Assembly (PCA) are firmly seated. Check that the wire harnesses are soldered to the various connectors, controls, and speaker. There should be no loose wires in the system. Remove the fuse from the PCA. It is marked FH1 and is a cylindrical component. Verify that the fuse is good by checking the continuity with a multi-meter. If the fuse is open, replace with the same type: 3.15 Amp, 250V, Fast Acting. Close the lid; re-install the screws and re-test the communicator. If the communicator still appears dead, contact Amron for further assistance.

7.8 LOW VOLUME

Check the volume control settings and adjust if necessary. Check the diver connections and verify that the diver and tender are connected as intended. Verify the wires and connectors are clean and tight. Check the BATTERY CONDITION INDICATOR and/or AC power connection. If the problem persists, disconnect the diver umbilical and perform the communicator check out procedure per section 7.1. If the communicator fails the check-out procedure, contact Amron for further assistance.

If the communicator checks out, then the problem is likely in either the diver umbilical communication cable, the wiring of the diving hat/helmet or the diver's microphone/earphone.

7.9 GARBLED VOICE TO THE DIVER

The TENDER TO DIVER VOLUME control is set too high. Reduce this control until the voice signal clears. If this does not solve the problem, check the diver's earphone for corrosion or other defect. Replace if necessary. If the tender is using a headset, remove the headset and communicate to the diver by pressing the PUSH-TO-TALK BUTTON and talking into the PANEL SPEAKER. If this solves the problem then the tender headset may be wet or defective. If the tender is using the PANEL SPEAKER to talk to the diver, check the speaker for any accumulated water. Drain the speaker if necessary. If these steps do not solve the problem then disconnect the diver umbilical and perform the communicator check out procedure per section 7.1. If the communicator fails the check-out procedure, contact Amron for further assistance. If the communicator checks out, then the problem is likely in the diver umbilical communication cable. If possible, substitute a known good cable to verify

7.10 GARBLED VOICE TO THE TENDER

The DIVER TO TENDER VOLUME control is set too high. Reduce this control until the voice signal clears. If this does not solve the problem, check the diver's microphone for corrosion or other defects. Replace if necessary. If the tender is using a headset, remove the headset and listen to the diver using the PANEL SPEAKER. If this solves the problem then the tender headset may be wet or defective. If the tender is using the PANEL SPEAKER to talk to the diver, check the speaker for any accumulated water. Drain the speaker if necessary. If these steps have not solved the problem, then disconnect the diver umbilical and perform the communicator check out procedure per section 7.1. If the communicator fails the check-out procedure, contact Amron for further assistance. If the communicator checks out, then the problem is likely in the diver umbilical communication cable. If possible, substitute a known good cable to verify.

7.11 DIVER CUTS OFF

This is usually caused by an intermittent connection between either the umbilical and the diver communicator or the umbilical and the diver's hat/helmet. The intermittent connection could also be inside the diver's hat/helmet. Check all connections to verify that they are clean and tight. If the problem continues, substitute the communication cable with a known good cable. If this solves the issue, then the communication cable in the original umbilical is damaged and needs to be replaced or repaired. If none of these solutions fixes the problem, contact Amron for further assistance.

7.12 FEEDBACK, FULL-DUPLEX (4-WIRE) MODE

There are two forms of feedback that can affect the 2840R-XX: acoustic feedback and cable crosstalk. Acoustic feedback occurs when an active microphone is close enough to pick up and amplify the signal from a speaker or earphone. The required distance between the microphone and speaker/earphone is dependent on the volume setting and the amount of acoustic isolation. For example, a tender headset left sitting on a work table my cause acoustic feedback. When the tender dons the headset at the same volume level, the acoustic feedback will no longer occur. The tender's head provides acoustic isolation between the microphone and earphone of the headset. The same is true for the diver's microphone and earphone.

To troubleshoot acoustic feedback issues first determine the source. One way to quickly determine the source of the acoustic feedback is to cover each active microphone with your hand, one at a time. Another method is to adjust the volume controls one at a time. The volume control that stops the feedback indicates the source. For example if the TENDER TO DIVER VOLUME control stops the feedback, then the problem is likely in the diver's hat/helmet. Common sources are feedback between the tender's headset microphone and the PANEL SPEAKER of the 2840R-XX. If the tender wants to operate with the headset and leave the PANEL SPEAKER on, Amron recommends the tender move away from the 2840R-XX by using the Amron Model 2822-28 Remote Walk-and-Talk Module. This module provides an "extension" cord for the tender headset allowing the tender to operate away from the 2840R-XX.

Crosstalk is caused by signal leakage between the microphone and earphone wires in the umbilical cable. In a good cable with all the wires open (not connected) the resistance between any two wires should be greater than 10 Meg-Ohms. Over time, the cable can be damaged and this resistance drops to the point that crosstalk can occur. When this occurs, the communication cable in the umbilical should be replaced. For a temporary solution, you can try swapping the position of the diver earphone wires on the DIVER EARPHONE jack. If you are using a banana plug, simply unplug the diver earphone and rotate by 180 degrees before reconnecting. If this does not solve the problem and the umbilical cannot be immediately replaced, then operate in 2-Wire mode until a replacement umbilical can be used. Amron strongly recommends the use of the Amron CC1 communication cable. It has been specially designed for clear communications and long service life.

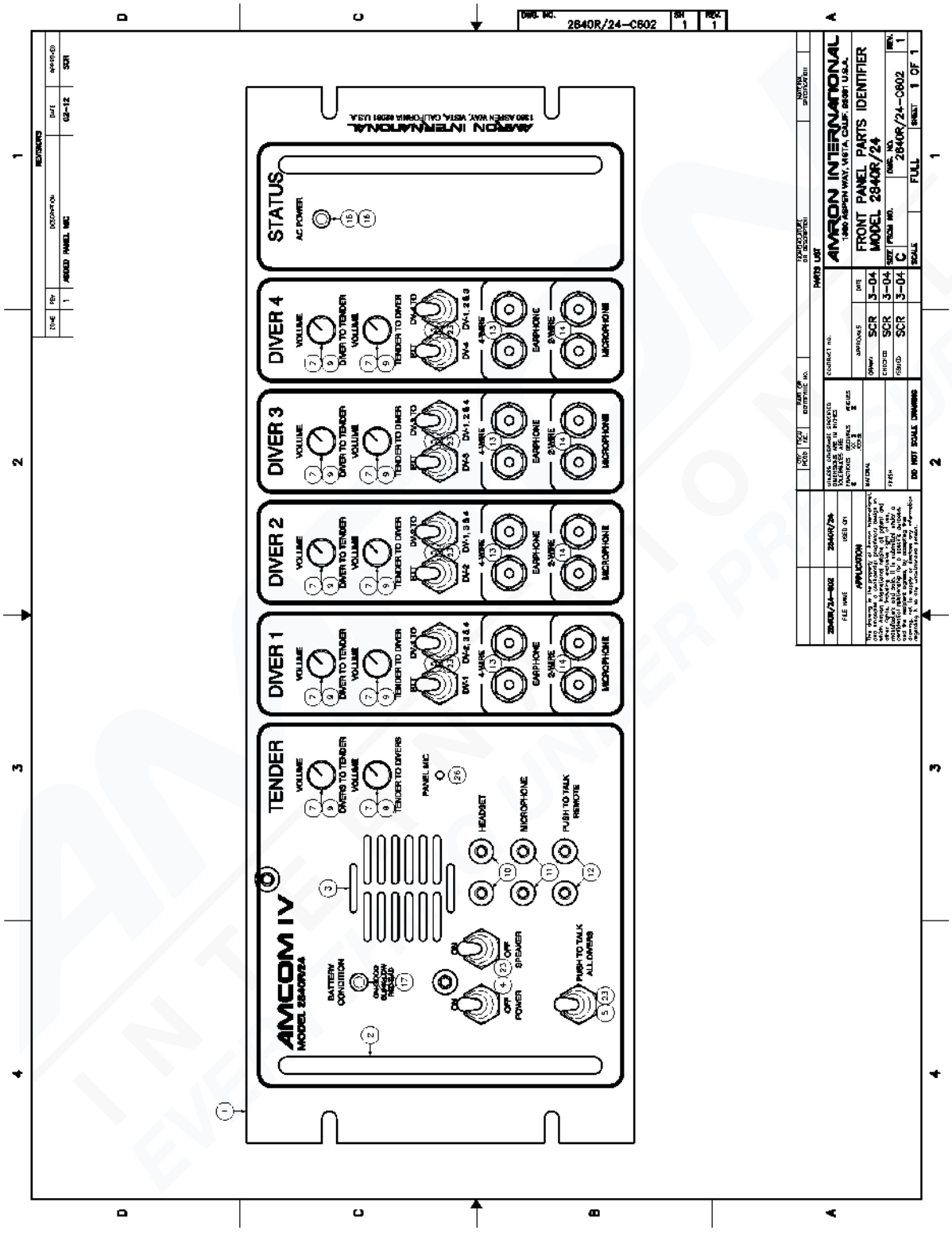
7.13 PUSH-TO-TALK DOES NOT WORK

If used, check the connection to the handheld microphone. A common issue is that the yellow banana plug is not properly seated in the PUSH-TO-TALK JACK. If the tender is using the PANEL SPEAKER as the microphone with the PUSH-TO-TALK BUTTON, make sure the SPEAKER SWITCH is turned on. If neither of these solves the problem, there could be a broken wire inside the diver communicator. Open the front panel and inspect all wire connections. If that does not resolve the problem then contact Amron for further assistance.

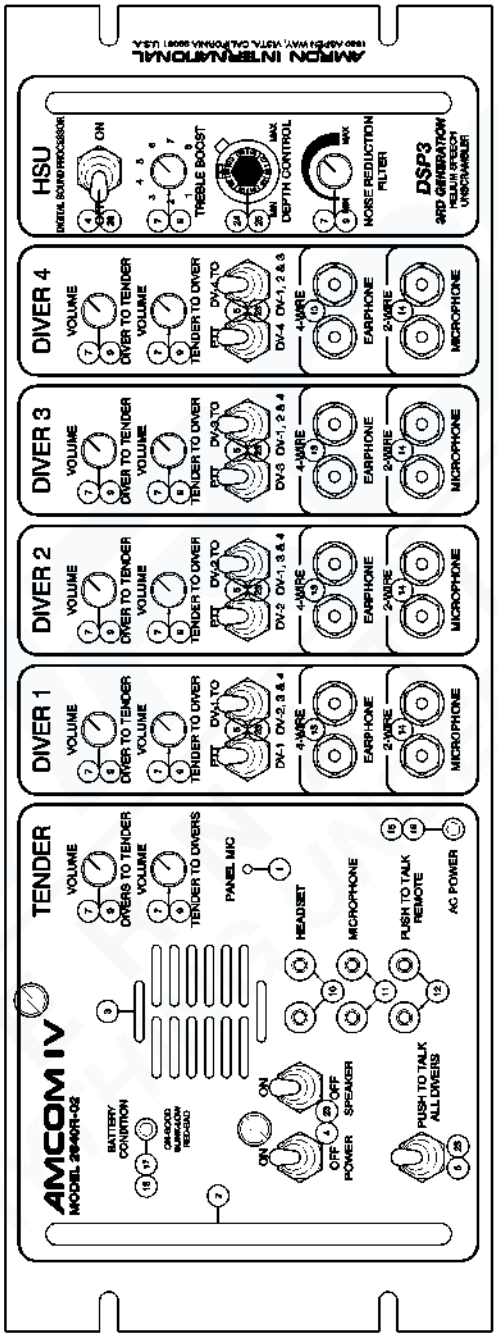
8 DRAWINGS

The following drawings illustrate the electrical and mechanical details of the AMCOM IV Diver Communications. The corresponding parts lists for each drawing are detailed in the parts lists section, or are included as part of the drawing. Amron reserves the rights to revise the documentation without notification.

8.1 PARTS IDENTIFIER, FRONT PANEL, MODEL 2840R-01



8.2 PARTS IDENTIFIER, FRONT PANEL, MODEL 2840R-02



9 PARTS LIST

The parts lists include both mechanical and electrical parts. The following information will be useful in interpreting data which is not self-explanatory.

REVISIONS

The parts lists in this manual are for the current model of diver communicator as of the printing date.

To Order Replacement Parts Contact:
Amron International, Inc.
1380 Aspen Way, Vista, California, 92081 U.S.A.
Telephone: (760) 208-6500 Fax: (760) 599-3857
Email: sales@amronintl.com
Web: www.amronintl.com

When ordering replacement parts, you should give as much information as possible to enable us to supply the correct part. This information should include the part number, description, reference designator, value, radio model number, and serial number. Failure to provide sufficient information may hinder our ability to fill your parts orders promptly and correctly.

9.1 AMCOM IV RACK MOUNT, MODEL 2840R-01

REF	PART #	DESCRIPTION
N/S	570-1008-24	AMPLIFIER PC CARD ASSEMBLY FOR 2840R-01
N/S	570-1008-21	AMPLIFIER PC CARD ASSEMBLY FOR 2840R-01 & -02
N/S	2840R-400	AMCOM IV R/M FRONT PANEL ASSEMBLY
N/S	190-0101-00	POWER SUPPLY AC/DC 90-264 VAC
N/S	2405-28	MICROPHONE PUSH TO TALK
N/S	2890-05	RECHAREABLE SEALED LEAD-ACID BATTERY 12VDC
N/S	MS-3106A-28-12P	MS CONN CABLE 26 PIN M
N/S	MS-3057-16A	MS CABLE CLAMP 24/28 SHELLS
N/S	MS-3420-16	BUSHING FOR PN MS-3057-16A
N/S	P-2392	CORD AC EURO 3 COND

9.2 AMCOM IV RACK MOUNT WITH DSP3 HELIUM SPEECH UNSCRAMBLER, MODEL 2840R-02

REF	PART #	DESCRIPTION
N/S	570-1008-21	AMPLIFIER PC CARD ASSEMBLY FOR 2840R-01 & -02
N/S	570-1008-24-HSU	AMPLIFIER/HSU PC CARD ASSEMBLY FOR 2840R-02
N/S	570-1006-02	DSP3 HSU PC CARD PROGRAMMED
N/S	2830-200-01	PC CARD ASSY RELAY SELECT
N/S	2840R-02-400	FRONT PANEL ASSEMBLY WITH HSU
N/S	2405-28	MICROPHONE PUSH TO TALK
N/S	2890-05	RECHARGEABLE SEALED LEAD-ACID BATTERY 12VDC
N/S	MS-3106A-28-12P	MS CONN CABLE26 PIN M
N/S	P-2392	CORD AC EURO 3 COND
N/S	MS-3106A-28-12P	MS CONN CABLE26 PIN M
N/S	MS-3057-16A	MS CABLE CLAMP 24/28 SHELLS
N/S	MS-3420-16	BUSHING FOR PN MS-3057-16A

9.3 SUB ASSEMBLY 2840R-400M, FRONT PANEL COMPONENTS

REF	PART #	DESCRIPTION
1	24XX-MIC	PANEL MICROPHONE ASSEMBLY
2	320-0093-01	HANDLE ROUND
3	SA818	SPEAKER 8 OHM 15 WATT
4	SW-201	SWITCH TOGGLE DPDT
5	SW-208	SWITCH TOGGLE DPDT-MOM.
7	91A1AB24B15	POTENTIOMETER 10K LINEAR
9	KLN-500B-1/4	KNOB BLACK AL .5DIA .25INSHAFT
10	1498-103	JACK BANANA BLACK
11	1498-102	JACK BANANA RED
12	1498-107	JACK BANANA YELLOW
13	14002B	5-WAY BINDING POST (BLACK)
14	14002R	5-WAY BINDING POST (RED)
15	LEDHOLDER-BLK.25	MOUNTING CLIP FOR 5MM LED
16	LEDGREEN	LEDGREEN BRITE
17	LT2462-24-D51	LED BI-COLOR RED/GREEN
23	SWB-0001	BOOT TOGGLE SOFT GRAY

9.4 SUB ASSEMBLY 2840R-02-400M, FRONT PANEL COMPONENTS

REF	PART #	DESCRIPTION
1	24XX-MIC	PANEL MICROPHONE ASSEMBLY
2	320-0093-01	HANDLE ROUND
3	SA818	SPEAKER 8 OHM 15 WATT
4	SW-201	SWITCH TOGGLE DPDT
5	SW-208	SWITCH TOGGLE DPDT-MOM.
7	91A1AB24B15	POTENTIOMETER 10K LINEAR
9	KLN-500B-1/4	KNOB BLACK AL .5DIA .25INSHAFT
10	1498-103	JACK BANANA BLACK
11	1498-102	JACK BANANA RED
12	1498-107	JACK BANANA YELLOW
13	14002B	5-WAY BINDING POST (BLACK)
14	14002R	5-WAY BINDING POST (RED)
15	LEDHOLDER-BLK.25	MOUNTING CLIP FOR 5MM LED
16	LEDGREEN	LEDGREEN BRITE
17	LT2462-24-D51	LED BI-COLOR RED/GREEN
23	SWB-0001	BOOT TOGGLE SOFT GRAY
24	113-10K0-05	POTENTIOMETER 10K OHM
25	190-0500-15	KNOB TURN COUNTING DIAL

9.5 28XXR-FS-02 SPARES KIT FOR 2840R-XX SERIES COMMUNICATORS

QTY	PART #	DESCRIPTION
2	KLN-500B-1/4	KNOB BLACK AL .5DIA .25IN SHAFT
2	1498-102	JACK BANANA RED
2	1498-103	JACK BANANA BLACK
2	1498-107	JACK BANANA YELLOW
2	14002B	5-WAY BINDING POST (BLACK)
2	14002R	5-WAY BINDING POST (RED)
2	91A1AB24B15	POTENTIOMETER 10K LINEAR
2	SW-201	SWITCH TOGGLE DPDT
2	SW-208	SWITCH TOGGLE DPDT-MOM.
1	LEDGREEN	LED GREEN BRITE
1	LT2462-24-D51	LED BI-COLOR RED/GREEN
1	0034.6019	FUSE 3.15A/250V MICRO QUICK
2	LEDHOLDER-BLK.25	MOUNTING CLIP FOR 5MM LED
4	SWB-0001	BOOT, TOGGLE SOFT GREY

9.6 OPTIONAL SPARES

REF	PART #	DESCRIPTION
N/S	570-1008-21	AMPLIFIER PC CARD ASSEMBLY FOR 2840R-01 & -02
N/S	570-1008-24	AMPLIFIER PC CARD ASSEMBLY FOR 2840R-01
N/S	570-1008-24-HSU	AMPLIFIER/HSU PC CARD ASSEMBLY FOR 2840R-02
N/S	570-1006-02	DSP3 HSU PC CARD PROGRAMMED FOR 2840R-02
N/S	190-0101-00	POWER SUPPLY AC/DC 90-264 VAC
N/S	2405-28	MICROPHONE PUSH-TO-TALK
N/S	2890-05	RECHAREABLE SEALED LEAD-ACID BATTERY 12VDC
1	24XX-MIC	PANEL MICROPHONE ASSEMBLY

10 LIMITED WARRANTY AND SERVICE POLICY

Amron International, Inc.

LIMITED WARRANTY & SERVICE POLICY

LIMITED WARRANTY

AMRON INTERNATIONAL, INC., (Amron) warrants that its manufactured products are free from defects in material and workmanship under normal use and service for a period of one year from date of shipment as described in Amron's literature covering this product. Oxygen Treatment Hoods and accessories are excluded and limited to 90 days. Amron's obligation under this warranty is limited to the repair of or replacement, at Amron's option, of defective material. This warranty shall not cover defects which are the result of misuse, negligence, accident, repair or alterations.

SERVICE POLICY

For technical assistance or to request a repair, please complete one of the following:

- *Amron Communicator Repair* : https://www.amronintl.com/communicator-repair-form
- *Repair Request* (all other products): https://www.amronintl.com/repair-form
- Call (760) 208-6500, Monday – Friday, 8 a.m. to 5 p.m. PST.

Both MODEL NO. and SERIAL NO. are required fields to be entered on the *Amron Communicator Repair Request* form and can be found on the products identification label as shown below.

"Sample" Product Identification Label

Do not return any product without obtaining a RMR (Return Materials Request). Detailed return instructions will be provided at the time of request.

1380 Aspen Way, Vista California 92081-8349 U.S.A
Phone: (760) 208-6500 Fax (760) 599-3857
Email: sales@amronintl.com Web: www.amronintl.com